

CLAIMS

1. Device for retaining a respiratory mask adapted to be used mainly in the field of non-invasive mechanical ventilation of airways, whether in a hospital, at home or in any other location where non-invasive mechanical ventilation is used, or for any other medical or non-medical application, this device comprising in particular a hub (1, 1') for receiving the shell (7) of the mask,

characterized in that the hub (1, 1') comprises at each of its two lateral ends, fixing elements (8) of the simple and fast unfastening snap-fastener type, having an articulation with a balance point on which are two laterally "clipped" right and left fins (2) on which are fixed straps (3, 4) of the harness positioned around the head, as well as the immobilization strap (5) for holding the patient's mouth closed, on the one hand, and in that the upper portion of the hub (1) is constituted of a strap (11) fixed at its ends and arranged to ensure the high retention of the mask so as to avoid frontward tilting during a substantial tension caused by the air inlet pipes of said mask and other accessories connected to the feed circuits.

2. Device according to claim 1, characterized in that the hub (1') is constituted of three affixed elements; first an upper veil (12) with two lateral extensions (13) for fixing the harness then, an intermediary, supple and elastic veil (14) receiving the mask shell (7) inserted through the base and positioned in an L-shaped groove (15) along the base of the outline and, lastly, a peripheral contact lip (16) adapted to take support on the patient's skin.

3. Device according to claim 2, characterized in that the hub (1') is arranged so as to be capable of adapting to any respiratory mask shells,

whatever their size.

4. Device according to any of the previous claims, characterized in that the hub (1') is made of medical quality silicone enabling a long-term use.

5. Device according to any of claims 1 to 3, characterized in that the hub (1) and the fins (2) are made by thermoforming PETG polyester or any other material having similar properties, or molding.

6. Device according to claims 2 to 5, characterized in that the hub (1, 1') is designed to allow for the mounting of respiratory mask shells (7) that are custom-built by an acquisition procedure in three dimensions ("3D"), digital or non-digital, recording the reliefs and the depressions of the patient's face, and used for making, by means of a digitally-controlled machining system, a mold representing the inner or outer shell print.

7. Device according to claim 8, characterized in that the mask shell (7) used is made by modeling the digital file or files that are obtained by means of a computer-assisted design software to make a mold by means of a step-by-step digitally-controlled machining system, which makes it possible to form the shell by thermoforming a sheet of synthetic material.

8. Device according to claim 7, characterized in that the computer-assisted design software is arranged to automatically take into account the specific morphology of each facial shape.

9. Device according to any of claims 7 and 8, characterized in that the mask shell is made by transferring the digital file(s) to the memory of a standard home computer or laptop equipped with a graphics cord and a modem, then transmitted via the Internet, or another telematic network, to a file exploitation site for making the masks.

10. Device according to any of the previous claims, characterized in that the mask shell (7) is connected to a pressurized gas-feeding pipe (17) by means of an articulated coupling (18) having a ball-and-socket joint.

11. Device according to claim 10, characterized in that the articulated coupling (18) comprises a female ball-and-socket joint (19) and a male ball-and-socket joint (20), one mounted on the respiratory mask, the other at the end of the gas-feeding pipe (17), both comprising a substantially cylindrical joint that can be funnel-shaped to allow for connecting and disconnecting couplings having a varying diameters.

12. Device according to claim 11, characterized in that the articulated connection (18) comprises at least one intermediary cylindrical coupling sleeve (21) comprising two spherical elements (22, 23), male and female respectively.

13. Device according to any of claims 10 to 12, characterized in that the clearance of the ball-and-socket joints of the articulated connection is limited by an annular lock pin (24) of the male portions taking support on an inner annular abutment (25) of the female portions so as to prevent the generally cylindrical ducts butt-joined in the ball-and-socket joints from being obstructed, even partially.

14. Device according to any of claims 10 to 13, characterized in that the articulated connection (18) is designed to allow for a vertical clearance angle equal to or greater than 90°.

15. Device according to any of claims 10 to 14, characterized in that the female ball-and-socket joint (19), the male ball-and-socket joint (20), and the intermediary coupling sleeve(s) (21) are each made of a single piece arranged to enable the mounting of the ball-and-socket joints by forcible nesting.

16. Device according to claim 15, characterized in that the female ball-and-socket joint (19), the male ball-and-socket joint (20), and the intermediary coupling sleeve(s) (21) are made of molded plastic material.